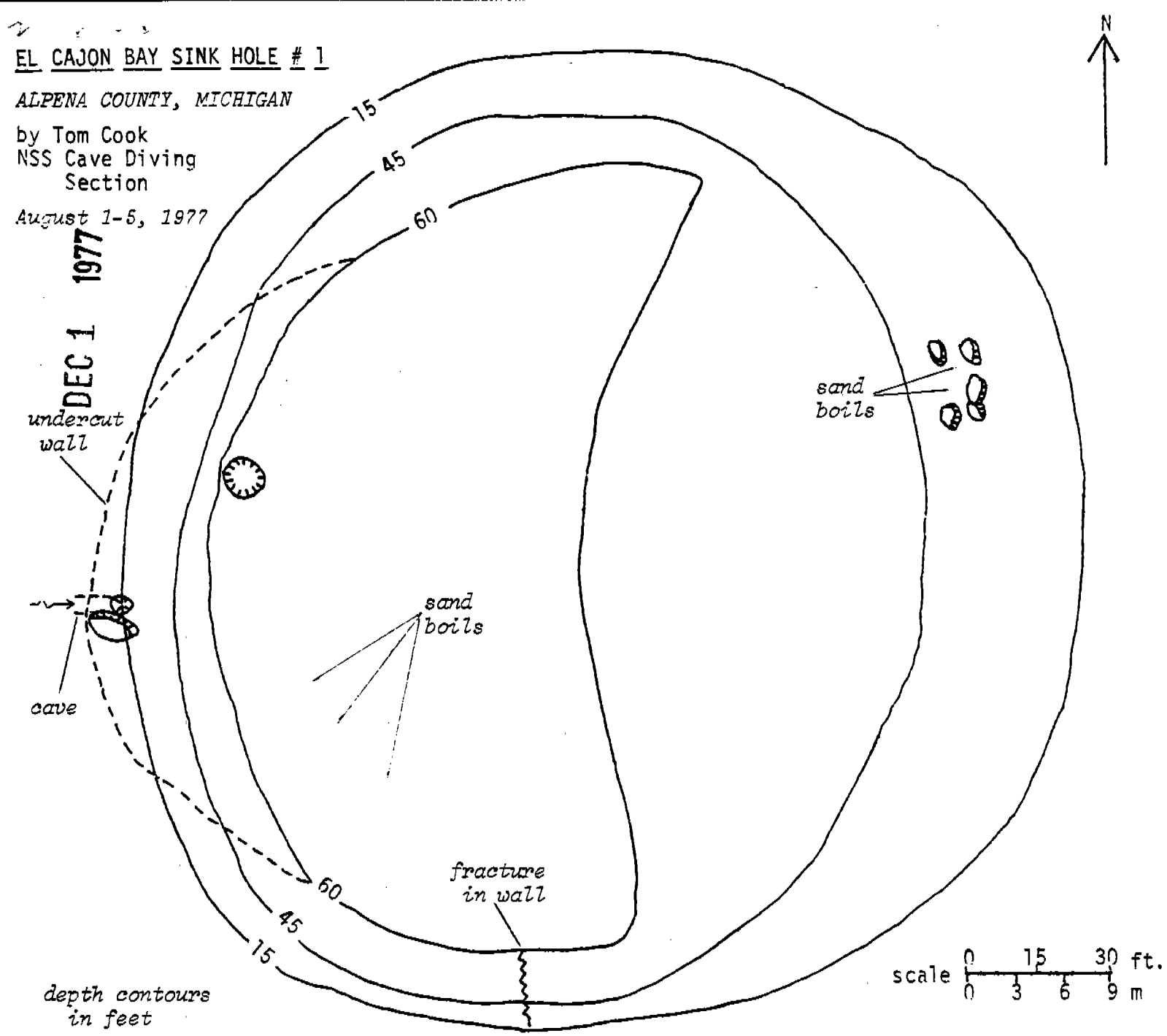


underwater speleology

OFFICIAL NEWSLETTER OF THE CAVE DIVING SECTION OF THE NATIONAL SPELEOLOGICAL SOCIETY vol. 4, no. 4

UNDERWATER SPELEOLOGY

published bi-monthly
beginning in February
by
The Cave Diving Section of
The National Speleological Society

Membership in the NSS Cave Diving Section is open to any NSS member in good standing that is interested in cave diving and has paid the dues ($3.00 for 1977). Persons not wishing to join may subscribe for $5.00 per year. Checks should be made payable to "NSS Cave Diving Section" and sent to Steve Maegerlein, Box 60, Williams, IN 47470.

Deadline is the second Friday of the preceeding month. Send articles and correspondence to the Editor, Sheck Exley, 1591 S. Lane Ave., Apt. 118C, Jacksonville, FL 32210.

Opinions expressed herein are not necessarily those of the NSS Cave Diving Section.

CALENDAR

Sep. 5-10: 3rd International Cave Diving Camp, Bristol, Great Britain. (This is just before the 7th International Speleological Congress - contact B.E.C. Travel Limited, 63 Dun Keld Road, Ecclesall, Sheffield S11 9HN England.)

Dec. 31-Jan. 1, 1978: 7th NSS Cave Diving Workshop, Branford, Florida. (Contact Sheck Exley, 1591 Lane Ave. So., 118C, Jacksonville, FL 32210.)

June 18-24, 1978: Cave Diving Session and Annual Section Meeting at NSS Convention, New Braunfels, Texas.

1979: 4th International Cave Diving Camp, Mexico. (Contact Eduardo Castro Ruiz, Cerro de Tezonco 117, Mexico, D.F.

COVER

Our cover this month is Tom Cook's plan sketch of his discovery at Big Sink in El Cajon Bay. Tom's find came during the last day of this year's NSS Convention, after just about everyone else had given up and gone home!!! See page 32.

NSS CAVE DIVING MANUAL

It was decided at the NSS Convention during the Annual Section Meeting that the Cave Diving Section would author a cave diving manual. This manual will hopefully fill a need for an up-to-date text on equipment and procedures to dive cave sumps as well as Florida-type resurgences. Each chapter will be contributed by a member of the Section. Advice is now being sought as to content, format and a name for the manual. Anyone with ideas should contact the editor, Sheck Exley (see address this page). After the basic outline is decided, authors will be solicited (anyone want to volunteer?) and chapters assigned. We are hoping to have the manual available by next year's NSS Convention.

NCRC NEEDS VOLUNTEERS

Tom Cook has been busy trying to get one cave diver in each region (and hopefully eventually each state) to be the contact person with the local grottos, to assist them in underwater recovery, rescue or baby sitting on the other side of short flooded sumps. This person would be responsible for contacting other qualified divers in his area. Several persons have stepped forward, but more help is needed (see p. 37): several areas have no one as of yet. For more information, contact Tom Cook, 378 Webster St., Manchester, NH 03104.

JUDY SPRING REVISITED

by Forrest Wilson
NSS 16631

Tom Cook (NSS 15548) made a short push into Judy Springs, West Virginia, after the convention last July. According to his report (Re: *Underwater Speleology*, vol. 3, no. 3, pp. 26-28), he used much of his air getting into the cave and didn't make more than a 90 ft. (27 m) penetration. He did, however, leave a question mark on his map that aroused the interest of some Virginia cave divers.

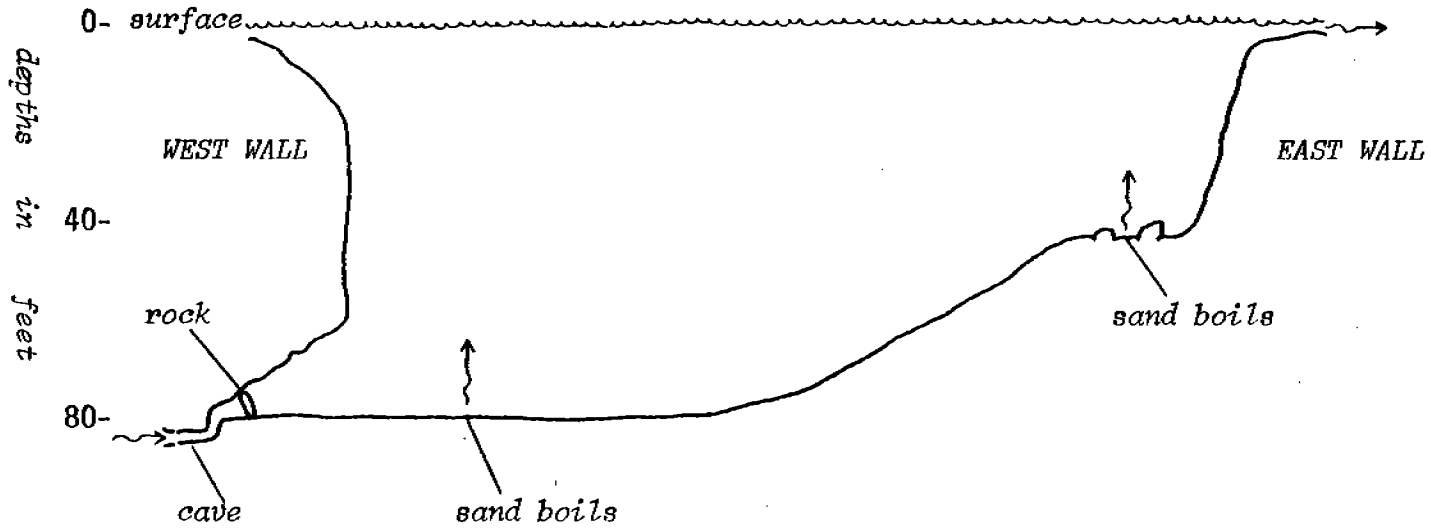
On July 9, 1977, Forrest Wilson, David Morrow (NSS 16997) and Carl Cowart (NSS 16638) went to Judy Springs. Following Tom's advice, they brought two singles each; one to clear the entrance and one to make the penetration. They found the entrance already cleared enough for singles, and noticed another entrance 20 ft. (6 m) to the north. The second entrance was a vertical chimney large enough for doubles. Without doubles along, they were forced to return for fresh tanks (80's) and made a penetration of 135 ft. (41 m). They found the water much clearer than reported by Tom Cook and resolved to come back with more line and with doubles.

The next trip was made July 24 by Forrest, David, Carl and Barney Burdis. Forrest and David made the first push and laid a permanent line. The water was not as clear as on July 9, but visibility was still about 15 ft. (5 m). The cave is about 40 ft. (12 m) at the deepest point, but steadily shallows after about 100 ft. (30 m) penetration. In some places, the walls and floor were beyond visibility; however, the average size was about 6 ft. x 10 ft. (2 m x 3 m) cross section. The passage is relatively straight, tending northward. After 500 ft. (150 m) penetration, the water gets very shallow and the ceiling height is less than 3 ft. (1 m). At about 650 ft. (195 m) penetration, the tunnel pops up into an air-filled chamber about 100 ft. (30 m) long with ceiling to water distance from 2 - 10 ft. (1 - 3 m). This room has stalactites! Forrest tied off the line and the two returned to report to the group.

After allowing some time for the silt to settle, Carl and Barney went in to see the room. They took along a jump line to check side passages, but pushed the end of the air-filled room instead. At the end of the air room, the passage goes back underwater for about 25 ft. (8 m) and pops up again in a second room, "Cowart's Room." This room is about 300 ft. (90 m) long and decorated with soda straws! They tied off the line in the second room and didn't have enough to check the lead at the end; however, they are sure that it "goes."

While the group never reached CAS on doubles, it is doubtful that this dive could be made on a single tank. They are planning on a return trip in the near future to finish exploration and to map the known passages.

above report dated July 26, 1977



EL CAJON BAY SINK HOLE # 1

ALPENA COUNTY, MICHIGAN
profile by Tom Cook
NSS CAVE DIVING SECTION
August 1-5, 1977

0 20 40
scale in feet

grade 1 survey
only depths are accurate, ± 3ft.
no vertical exaggeration

el cajon bay sink hole no. 1

by Tom Cook (NSS 15548)

On a rousting good day which was a Monday the NSS Cave Diving Section members attending the Alpena (Mich.) convention packed a canoe full of diving gear and pulled it (under the direction of the great crawdad) from Misery Bay to the sinks of El Cajon Bay. Those who were part of this great march were: Karan Exley (NSS 16265), Sheck Exley (NSS 13146), Brad Smith (NSS 13622), Doug Carter (NSS 14870), Paul Smith (NSS 14385), Steve Maegerlein (NSS 8340), Clarence "Bud" Dillon (NSS 11273) and yours truly. All except Karan and Steve (who were to wait on the shore to fend off the owner and his dogs) dived in a recon of the sink.

Dick Hunter, a resident of Alpena (where the sink is located) who has been diving and exploring sinks, caves, mines and wrecks in the area for many years told me that he was in sink # 1 about 8 or 10 years ago. He said that there was a spring at 40 ft., then a narrow ridge rising up in front of the spring depression, then an abrupt drop off to the floor of the sink 30 feet below. In the opposite wall (west wall) there was a shallow undercut about 10 feet deep and high and 20 feet wide, at the back of that undercut where the sand floor met the sink wall was a tunnel from which water exited in a great force so that entry was difficult. There was also a hole about 5 ft. in diameter and about 10 ft. deep just north of the tunnel on the sink floor; he thought that it was filled with stones.

Well, we found the 1st spring at 45 ft. It was a series of sand/shell boils in a small crater of breakdown; however, there was not an abrupt dropoff to the sink floor, only a gradual sand slope of approx. 30 degrees leading down. We spent the rest of the time looking for the other spring at 70 ft. but it was zoo nada.

On Thursday a second dive was attempted using Terry More's (NSS 15798) boat (which had been sunk that Sunday in a storm), but Misery Bay was too shallow and we did not reach the sink. That night I talked to Dick again and he said that he was sure that there was a big spring at 70 feet on the west wall. So, Thursday night (spurred on by cave diving movies and slides we were showing, Brad and I decided to give it another go in the morning. After saying goodbye to Sheck and Karan and Paul, Brad and I set off for Olson's Landing and hit the water with our canoe loaded with equipment, determined to leave no scum pocket unsilted. We met Bud at the sink, somehow he had talked the geology field trip to carry his equipment in. He had gotten rock samples for Irv Kuehner, the regional geologist. Bud had not found the spring, but had located sand boils at 75 ft. and possible fault line indications? So Brad and I hit the sink, Brad swimming north and me south, hoping to meet at the west wall with good news. The sink is a mud wall down to 45 ft., then the rock sink wall is exposed. At 60 ft. the rock wall disappears into a down-sloping mud bank. I followed this contact towards the west and noticed the wall was becoming undercut. By the time I reached the west wall the undercut was very large and I was low on air. I was about to look for Brad and then surface when I saw a large rectangle of breakdown in the far reaches of the undercut. It was leaning against the far wall. I swam over and looked around and there it was!!!!! in the floor between the slab and the wall. I looked around for Brad, not seeing him and not having enough air to look for him in this large sink I decided

to tie off my line and see if I could enter the 2 ft. x 2 ft. hole. I went in the old northeast way, feet first, for about 6 or 7 feet, enough to say I had been cave diving. It trended to the west and the tunnel was level.

I pulled myself out and went for the surface. I was putting my stuff away when Brad swam over and said that he had found a hole, too. It was north of the west wall spring, was about 5 ft. in diameter and approx. 8 to 10 ft. deep and filled with cobbles. We compared notes and paddled away, laughing at Sheck's parting words, "I'm leaving for home now... I don't want to read about you guys finding any large spring tunnels today." Well, that's a squirrel for you: leaving when the going gets good. Or maybe the 60 degree water was too cold for him and his dry suit.

The temps taken at various depths are: 10 ft. - 64° F, 60 ft. - 54° F, 80 ft. - 52° F, the 45 ft. spring was 54° F. After the dive I went over to Dick Hunter's to say goodbye and thanks. We came to the conclusion that there had been a cave-in at the west wall, as he said the tunnel went straight into the wall and was big enough to get into and there was no big piece of breakdown. Also there was a very definite dropoff at the 45 ft. spring, which is just a sand slope now. So it seems that major changes have taken place in El Cajon Sink over recent years, cave-ins and sediment filling. The west wall undercut may not be all that stable as when I was surfacing I noticed air bubbles coming up out of the mud far back from the edge at a good rate. This may indicate that there are large cracks in the west wall overhang so it may not be done collapsing yet. If one were to go back to the spring he would need to dig the entrance out a bit, and I don't think doubles would fit in. The passage itself is lined with clay making visibility zoo nada. The sketch maps are not to scale. The top of the sink is approx. 200 ft. in diameter, and lies completely submerged in El Cajon Bay, which at the time we were there was about 6 inches deep in the vicinity of the sink.

* * * * *

NSS CONVENTION WORKSHOP ON MICROCOMPUTERS IN CAVING

reported by Stephen D. Maegerlein (NSS 8340)

The August 5 meeting was chaired by Dan Murphy and was starter by having the 40 participants introduce themselves and describe their interest in computers. Many at the workshop were involved in computer programing; others worked in system design and computer maintenance. All were enthusiastic about applying computers to cave exploration. There was discussion of the numerous computer programs already in use around the country which convert polar coordinate data to Cartesian coordinates, correct for closure errors, and make line plots of the survey data. The discussion soon turned to small, inexpensive personal computers that could be carried into caves. Some of the applications discussed were: (1) microcomputer-based equipment which can be used in caves for recording survey data, (2) laser range-finder and compass coupled by microcomputer to a tape recorder, (3) safety equipment for cave diving using microcomputers to monitor diver physiology and life support systems, and (4) automatic cave surveying equipment for cave divers. Watch for additional information in *NSS News*.

THE BEAUTY and THE BEAST

by Mark Leonard

Somewhere in north central Florida around the towns of High Springs and Fort White there is a swamp located on the Sante Fe River. Here in mid-December the Beauty met with the Beast. The Beauty being 5'4", blond, blue eyes and a smidgen over 100 pounds, the Beast was 6'5", blond headed with beard and 310 pounds. Their meeting was not for a fairy tale but to conduct a YMCA-NACD diving course. The course extended over six days. They were six long days combining as many as three dives in a day in addition to lectures covering all aspects of cave diving. There were only four students which meant it was a relaxed but busy pace.

It was a cold, wet December in Florida. It would either rain (or almost snow) or be extremely cold. But this did not hamper the Beauty or the Beast. The lecture went on covering topics like "philiosophy," "buddymanship,""rescue," "accident prevention,""body positioning,""buoyancy control,""use of reels,""line techniques,""history of cave diving,""first cave wedding,""air consumption theory,""first aid," and, of course, "stress" lectures.

Steve McBee and Mark Leonard added a new form of stress to the lecture. It seems that on a training dive with the Beast as the instructor, they could not get either techniques or body position right and stirred up some silt. It was so bad that the term "silt out" had a new meaning. The stress was introduced, not by the silt, but rather by the presence of the Beast. That was one debriefing that neither Mark nor Steve were looking forward to. Lucky for them, it was early in the course and they had many chances to redeem themselves. Kotter has his Sweat Hogs, the Beast has his Silt Hogs.

In all seriousness, the four students learned a tremendous amount in just six days. It was a very productive week. Even after fourteen years of diving, three of which I was cave diving, I felt that there was a lot to learn. It truly is a course I would recommend for anyone who thinks he or she is a cave diver, or is interested in becoming one.

There was even time to do some creative writing:

Mary, Mary quite contrary
How does the dive go
With light so bright and line so tight
And divers all in a row?

Octopus, octopus with hose so long
Where is the one for the diver below?
With lights growing dim and air running low
The divers below need to know.

With lines so tight and the diver just right--
If the fins are held up right
There will be no silt in sight.

With gauges all checked and slates all wrote right
If the time is right --
There will be no Decompression Stops tonight.

The Course is all done, Divers all complete,
All is left is to thank our teach.

Our thanks to the Beauty, Mary Melton, and the Beast, Jim Fishback, from the Class of December '76.

* * * * *

INTERNATIONAL LONG CAVE DIVES LIST, 9/77

compiled by Sheck Exley, NSS 13146

only the longest dive at each site is listed - distances are linear distance from the nearest air surface or cave entrance in totally submerged passage

	distance feet	distance meters	date	location	diver(s)
1.	4110	1253	5/11/75	Friedman Sink of Manatee Spgs. Cave System, Fla., USA	C. Smith, L. Holtzendorff, S. Exley (USA)
2.	3512	1071	9/25/77	Dorado Chasm, Fla., USA	S. Exley (USA)
3.	3305	1007	4/20/75	Devils Eye Cave System, Fla., USA	C. Smith, L. Holtzendorff, S. Exley (USA)
4.	3300	1005	/ /77	USA	2 divers (USA)
5.	3080	939	/ /77	Keld Head, Kingsdale, Great Britain	O. Statham (G. Britain)
6.	3050	930	?	Rinquelle, Switzerland	J. Hasenmayer (Germany)

NOTES

1. source: personal participation. Bottom time, 128 minutes. Max. water depth 103 ft. (31 m), average est. 80 ft. (24 m). Temperature 72° F (22° C). Installed fixed nylon line premeasured against surveyor's tape. Double stage.
2. source: personal participation. Bottom time, 114 minutes. Max. water depth 70 ft. (21 m), average est. 60 ft. (18 m). Temperature 72° F (22° C). Installed fixed nylon line premeasured against surveyor's tape. Single stage.
3. source: personal participation. Bottom time, 129 minutes. Max. water depth 103 ft. (31 m), average est. 90 ft. (27 m). Temperature 72° F (22° C). Installed fixed nylon line premeasured against surveyor's tape; earlier unmeasured sections resurveyed with tape in cave. Double stage. Duplicated by C. Smith, L. Sollenberger and S. Foreman (USA) in 8/77.
4. source: verbal report of participating divers, who request to limit information released at this time. Depths quite shallow, temp. 50° F (16° C). No staging. Bottom time, 110 min. Max. water depth 20 ft. (6 m).

5. source: letter from O. W. Statham, participating diver, dated 7/28/77. Bottom time on 2750 ft. dive on 8/15/76, 90 minutes. Max. water depth on same date 44 ft. (13 m).

6. source: letter from J. Hasenmayer, participating diver, to L. S. Holtzendorff in 1975, and B. Leger - "Ou en est la plongee souterraine francaise?" *Bulletin d'Information de l'Equipe Speleo de Bruxelles*, no. 57 (Dec., 1973), pp. 37-38. Max. water depth 150 ft. (45 m). Temperature 45° F (7° C). Measured with stainless steel wire. Traversed to no-exit air space in cave at 930 m, returned via same route. Leger gives this distance as "1100 m" but Hasenmayer corrects this in his letter.

ADDITIONAL NOTES

One of the biggest problems in the compilation of a list like the above is that of poorly-measured or even estimated distances, which tend to be greatly exaggerated. An example is a dive by the writer and C. S. Stevens at Little River Springs Cave, Florida, reported on p. 3 of *Cave Diving Manual* (Mount, 1972) as "3200 ft." which was later measured to be only 2200 ft. *Skin Diver* ("A Light In Hornsby Sink" by J. Anthony, July 1973) reports a traverse of "3000 ft." which was later measured as 2119 ft. B. Leger's interesting article cited under source 6 above also adds to the confusion by quoting Michel Siffre with regards to resurgences in Florida explored in excess of "1200 m" (3936 ft.). However, by the date of the publication of Leger's article the longest penetration in Florida was at Devil's Eye, by the writer and C. Stevens, about 2500 ft. (762 m). Leger also mentions a "1000 m" dive at Cala Lune (by the Spanish?) which sounds suspiciously like an estimate. Perhaps a good basis for comparison is that of bottom time - the writer has found that the maximum efficient swimming speed for a long cave dive appears to be about 70 ft. (21 m) per minute, so 3000-ft. dives made on bottom times of less than 85 minutes are improbable.

* * * * *

REGIONAL DIVING OFFICERS, NATIONAL CAVE RESCUE COMMISSION

by Tom Cook (NSS 15548), N.C.R.C. National Diving Officer

The following Section members have filled the various regional diving positions of the N.C.R.C. They should be contacted in the event of any search, rescue or recovery operation involving cave diving in their respective areas.

1. Northeast Region - Tom Cook, 378 Webster St., Manchester, NH 03104; phone (603) 668-8573.
2. Northwest Region - Rick Rigg, 169 E. 25th, Idaho Falls, ID 83401; phone (208) 524-5688.
3. Central Region - Clarence Dillon, 326 Miami St., Elletsville, IN 47429.
4. Southeast Region - Sheck Exley, 1591 Lane Ave. So., 118C, Jacksonville, FL 32210; phone (904) 786-7204.
5. Puerto Rico - John Kessler, 22 Yardley Place, Apt. 2-B, Santurce, Puerto Rico 00911.
6. Canada - Doug Carter, 33 Delhi Ave., Toronto, Ontario, Canada M5M 3B8; phone (416) 489-6703.

200 CUBIC FOOT TANKS

by Jamie Stone

If you are interested in large volume SCUBA tanks,then I have what I believe will be the nearest thing to the ideal tank you will ever see. I have arranged for a company to make a batch of tanks which will hold close to 200 cubic feet with a working pressure of at least 3000 psig. They will be large, but diveable. In fact, they will be just about the maximum practical size and pressure for diving purposes. That is why I consider them the ideal large volume tank. When you maximize size and pressure, you have maximized capacity. And the really surprising thing about them is they will only weigh about 44 pounds, or about the same as hundreds. As cave diving doubles, or ocean diving singles, they will be unbeatable.

The basic tank will be a standard steel round-bottomed 1850 psig cylinder. It will be wrapped in fiberglass with a special DOT-approved process in order to raise the working pressure. The exact working pressure is not definite at this time, but it will be at least 3000 psig. One wrapped tank will be burst, so we will have definite documented evidence of the burst pressure. It is the fiberglass that keeps the weight of the tank reasonable. If tanks this size and pressure were made completely of steel or aluminum, they would weight at least 75 pounds, and probably more.

Of course, there will be some problems to deal with, as there always are with anything new. Probably the worst problem will be buoyancy. A full tank will be about 5 to 10 pounds bouyant. And, of course, this buoyancy will increase throughout a dive. This increase will be more than we're used to, because of the larger amount of air (10-15 pounds per tank). All of this means simply that we will have to use more lead. Another problem may be the reluctance of some dive shops to fill these very unusual tanks. Other minor problems will be getting harnesses, manifolds and bushings for the one inch neck.

The cost of these tanks is going to depend very much on how many we order, but the estimate is about 250 dollars per tank. That sounds like a lot, but if you consider the prices of tanks today and the fact that one of these tanks will hold more than any set of doubles on the market today, it isn't too bad. And if you consider the quantum leap they will mean to cave diving capabilities, they become quite cheap. We are getting the tanks new direct from the manufacturer, and the wrapping direct from the wrapping company. There will be no retailer or dealer or middle men at all (and I'm not getting any cut either).

If you, or anyone you know, is interested in these tanks, please get in touch with me immediately for more details. Do not delay, as I plan to place this order the first week of October, and I must have $250 per tank before I order. I also expect that this will be the only batch of these tanks ever made. Please pass the word to anyone who might be interested, since the more we order, the less they'll cost. I presently have orders for 22. I hope to be hearing from you: Jamie Stone, 1125 NW 36 Rd., Gainesville, FL 32601. Phone: (904) 378-7697.

The overall length of the tank is 29.75 in. (3.25 in. more than 100's), outside diameter is 9.4 in. (1.5 in. more than 100's).

REVIEW: HAND SIGNALS FOR CAVE DIVING

reviewed by Sheck Exley (NSS 13146)

Hand Signals for Cave Diving, by Claudette Finley, 1977, NACD Information Circular # 1, 20 pp., 60 illustrations. $1.00 from NACD, 2900 NW 29th Ave., Gainesville, FL 32601.

Lewis Holtzendorff was one of the first to recognize a need for standardized, specialized hand signals for divers buddy diving in caves. While serving as president of Florida's NACD in 1975, I created the "Hand Signal Standardization Committee" at Lewis' request and made him chairman because of his interest in the matter. Lewis got off to a good start, publishing and mailing a questionnaire for input from other cave divers (see vol.2, no. 4 of *Underwater Speleology*, pp. 34-35), but his work was interrupted prior to its completion because of his accident. The most active member of Lewis' committee was Claudette Finley, whose impeccable credentials include her position with the Communications Sciences of the University of Florida, and I appointed her to take over Lewis' job.

And what a job she has done! With the help of Jamie Stone and Carol Vilece she has compiled what is easily the most comprehensive list of divers' hand signals ever published, and promises to greatly improve the safety of buddy diving in clear-water caves. *Hand Signals for Cave Diving* contains at least 89 hand signals and 2 light signals selected according to the following criteria: performed with one hand only, each sign conveys one complete idea, easily performed and understood, and previous acceptance by the diving community.

A nickle a page may seem like a steep price to pay, but *Hand Signals for Cave Diving*'s usefulness in all phases of diving safety and enjoyment make it well worth the price.

* * * * *

***** ANNOUNCEMENT *****

ring in the New Year with the Cave Diving Section of the National Speleological Society...

SEVENTH CAVE DIVING WORKSHOP

Branford Women's Club, Branford, Florida
Saturday and Sunday
December 31, 1976 & January 1, 1977

discussions - lectures - films - slides - used equipment bazaar - publications sales

and

GUIDED PRACTICE DIVES IN YOUR FAVORITE SPRINGS CAVES & SINKS
including the sensational new discovery

DORADO CHASM